

CHAPTER IV

AGRICULTURE AND IRRIGATION

53. What was said of agriculture in Koraput in 1941 by R. C. S. Bell holds good in some measure even today. An extract* from his Chapter on "Agriculture" is given below:

"In Koraput the soil is tilled at elevations ranging from 200 to 4,000 feet above sea-level and, as would be expected, conditions and methods of cultivation vary widely at different altitudes. But in general agricultural practice is primitive and far more backward than in the plains of the adjacent districts of Vizagapatam and Ganjam. There is very little artificial irrigation, manure is little used, implements are of a crude type and the livestock is extremely poor. On the other hand, the rainfall is generally plentiful. In the Rayagada subdivision, the best cultivation is found in the Vamsadhara valley above Gunupur, and in the Nagavali valley near Kalyana Singapur, both of which are good rice-growing areas. On higher lands in the Rayagada and Nowrangpur taluks plenty of rice is grown and the valley of the Indravati, which separates these two taluks, is the principal granary of the district. The land on the 3,000-foot plateau is undulating and unsuitable for wet cultivation. Rice is there only grown in terraced stream-beds, and dry crops such as *mandya* and *olisa* (niger seed) are cultivated on the higher ground. In the Malkangiri taluk cultivation is only carried on in the sketchiest manner, the most typical forms being the Podu cultivation of the wild tribes in the hills in the east of the taluk and the rather casual growing of rice in swampy clearing in the forests in the plain lands."

54. Land reclamation

Culturable waste in the district being scarce over a hundred thousand acres of forest had to be cleared to provide land to the Dandakaranya Authority for reclamation and resettlement of persons displaced from East Pakistan. Large areas have also been given to Scheduled Castes and Scheduled Tribes for reclamation and cultivation in place of shifting cultivation practised in the past. Land levels change so fast that there is little scope for extensive use of tractors except at places in the Nowrangpur subdivision.

55. Irrigation

The general land surface which is a difficult terrain of rugged tracts and varying altitudes makes flow irrigation impossible in many areas.

*R. C. S., Bell *Orissa District Gazetteers*—Koraput, p. 107

The Jeypore estate had two masonry dams built on the Sokota Nala and the Champikota Gedda irrigating about 280 and 1,000 acres respectively. Both these dams continue to be useful.

Tank irrigation was not being practised in the district in the past. It has been pointed out in Chapter I that most of the tanks called *Mundas* or *Bandhas* owed their existence either to the enterprise of the former rulers or to charitable persons and they were intended for bathing and drinking purposes. The *Sagars* which are formed by construction of large embankments were sometimes being tapped for irrigation. But tank irrigation is now being undertaken at several places.

There is no major or medium irrigation project in the district. Some are presently under investigation on the Kolab and the Indravati. A recent rough survey shows that there are more than a hundred minor irrigation sources, mostly tanks and small reservoirs, each irrigating less than 60 acres. These sources together are estimated to irrigate about 5,000 acres. There are larger projects numbering about 233, each irrigating more than 60 acres. These are mostly tanks and only a few are diversion weirs. The ayacut estimated for all these projects is about 40,000 acres.

A list of Irrigation Projects completed by the Revenue Department and Block Agencies after vesting of Jeypore estate in the State Government during the First and Second Plan periods is given below:

First Five-Year Plan

	Area benefited by the Project	Number of Projects completed
	Acres	
1. Pottangi tahsil ..	860	9
2. Koraput tahsil ..	1,530	23
3. Malkangiri tahsil ..	510	9
4. Nowrangpur tahsil ..	1,529	19
5. Borigumma tahsil ..	35	1
6. Umarkot tahsil ..	190	3
7. Jeypore tahsil ..	1,593	10
	6,247	74

Second Five-Year Plan

		Area benefited by the Project	Number of Projects completed
		Acres	
1. Pottangi tahsil	..	1,500	5
2. Koraput tahsil	..	250	3
3. Jeypore tahsil	..	482	4
4. Borigumma tahsil	..	373	3
5. Malkangiri tahsil	..	1,147	5
6. Rayagada tahsil	..	5,930	18
7. Bissamcuttack tahsil	..	4,280	8
8. Gunupur tahsil	..	1,950	13
9. Nandapur tahsil	..	800	5
10. Lamptaput block	..	50	1
11. Borigumma block	..	2,109	13
12. Umarkot block	..	423	5
13. Nowrangpur block	..	506	8
14. Papadahandi block	..	305	6
Total	..	20,105	97
Grand Total	..	26,352	171

The following table shows the number of projects and area benefited during the Third Plan period (up to June 1964) *

Name of Block	Number of Projects	Area benefited by the Projects	
		Khariff	Rabi
		Acres	Acres
Jeypore	.. 2	188	..
Borigumma	.. 14	1,108	90
Nandahandi	.. 5	438	80
Papadahandi	.. 11	717	60
Pottangi	.. 8	713	290
Govindapalli	.. 1	100	50
Kotpad	.. 3	180	..
Raighar	.. 3	80	..

* Information obtained from Rural Engineering Organisation

Name of Block	Number of Projects	Area benefited by the Projects	
		Khariff	Rabi
		Acres	Acres
Kundra	.. 3	131	..
Boipariguda	.. 1	50	..
Dasmantapur	.. 3	152	..
Lakshmipur	.. 5	330	175
Narayanpatna	.. 7	1,020	500
Semiliguda	.. 6	780	320
Lamptaput	.. 2	100	40
Nowrangpur	.. 8	459	55
Nandapur	.. 8	650	340
Kasagumuda	.. 2	93	..
Umarkot	.. 3	198	..
Mathili	.. 3	107	..
Kalimela I	.. 3	140	..
Kalimela II	.. 1	80	..
Gunupur	.. 7	659	..
Padmapur	.. 6	602	30
Gudari	.. 7	517	..
Ramanaguda	.. 9	770	..
Bissamcuttack	.. 17	1,105	132
Muniguda	.. 5	1,930	250
Rayagada	.. 3	820	300
Kulnara	.. 2	125	..
Kalyansingpur	.. 8	340	20
Chandrapur	.. 1	60	..
Kashipur	.. 2	120	..
Tentulikhunti	.. 1	56	..
Kudumulugumma	.. 1	40	..
Malkangiri I	.. 1	50	..
Chandahandi	.. 2	127	..
Koraput	.. 1	44	..
Total *	.. 174	15,179	2,732

There is scope to extend lift irrigation in some areas particularly the Indravati basin. Trial boring at some places shows water-bearing strata at inaccessible depths and, therefore, the idea to start tube-well irrigation in those areas has been abandoned. One such tube-well has been successfully working in Gunupur subdivision with a capacity of 15,000 gallons per hour. Two pump-barge units have been set up at Kotpad to pump water from the Damayanti lake which is the moat of an old fort. Perhaps the most noteworthy is the Nagavali Lift Irrigation Co-operative Society organised at Rayagada since September 1959. The Nagavali is a deep-cutting river carrying plenty of water but over a hundred feet below the bank-level. It is only by power lift that the water can be used. Before organisation of this society, the Jeypore Sugar Company had investigated an irrigation project for about 3,000 acres in Rayagada area by pumping water from the Nagavali river. They had taken up execution of the scheme consisting of the pumping stations at Tumbiguda and Chekaguda. The Co-operative Society took over the work by agreement with the Company.

The Gedda lift irrigation project at Rayagada was executed by the Public Works Department through the Jeypore Sugar Company in 1961-62. Its capital cost is Rs. 1,73,254. About 300 acres are irrigated.

Water is raised from the Gedda at two stages, at the first stage by a 165 H. P. pump with a stand-by pump of 75 H. P. and at the second stage by a 35 H. P. pump with a stand-by pump of 20 H. P.

56. Rainfall, degree of dependence

Agricultural season begins with the summer showers and thunderstorms of April and May and during these two months the district in most parts receives an average rainfall of 4 to 5 inches. The cultivators are seldom disappointed in their expectations of rain during this period. With the onset of the monsoon in the middle of June the main period of agricultural activity begins and continues till the middle of December, by which time the paddy, the staple cereals and the chief industrial crops, like oil-seed, niger and gingelly, are harvested. The four months, December to March, have little rain and are suitable for cultivation of vegetables, tobacco, pulses and wheat. By the middle of March practically every crop is harvested. Nature enforces on the cultivators a whole month's holiday during *Chaitra* until the showers of *Baisakha* call him back to the plough. So by natural tradition this becomes the month of feasting, hunting and love-making.

57. Soil conservation

An account of the type of cultivation locally known by the name 'Podu' has been given later in this Chapter. Shifting cultivation is carried on by the tribes in many districts of Orissa. The problem of

soil erosion—a result of this type of cultivation—is most acute in areas within Koraput and Kalahandi districts, where there is a preponderance of Khond population. The following soil conservation measures have been taken up in the district to tackle this formidable problem.

The soil conservation scheme in the Machkund basin, which lies in the western slopes of the Eastern Ghats and covers an area of 290 square miles within the State, was taken up in March 1956. The object was to reduce the inflow of silt into the Jalaput reservoir and to persuade the Adivasis to take to permanent agriculture. Besides shifting cultivation, the undulating nature of the terrain, bare hills and friable soil with high rainfall had subjected the area to accelerated sheet and gully erosion with consequent deterioration of soil fertility at an alarming rate. It was a five-pronged attack. Contour bunding on 27,988 acres, plantation of trees of economic importance like cashewnut, bamboo, silver oak on 11,000 acres, agave plantation in 220 acres, coffee plantation and bench terracing in about 30 acres are some of the measures adopted at a cost of about 17 lakhs. The scheme is being pursued.

Three water-shed management units—part of a scheme designed to conserve soil by preventing erosion—have been started in the district since 1959. Each unit comprises an area of about 10,000 acres, where schemes like contour bunding, tree planting and conservation farming are being taken up together.

There are various degrees of the problem. There are badly eroded areas which are unfit for any cultivation and where the problem of sand-casting has set in. These areas need stabilisation of soil and constitute about 10 per cent of the eroded areas. The remaining 90 per cent comprise areas of cultivated land which are facing a gradual process of erosion either due to bad agricultural practices or lack of protective works. These areas need protection.

A pattern of cultivation and soil protection is being laid out in this district which will form the basis of a large-scale programme to be introduced later in the other affected areas of the State. Indiscriminate grazing by cattle at higher slopes of the hills is being discouraged. Some grazing land at lower slopes is being set apart.

On the recommendation of experts of the Technical Co-operation Mission, the grass waterways system has been evolved in this area as a new idea in soil conservation. The All-India Soil and Land Use Survey (Ministry of Food and Agriculture) is undertaking survey of catchments of the Machkund Dam in order to advise on the best methods of soil conservation necessary for the safety of the dam.

A pattern of mixed cropping with laguminous and non-laguminous crops is being attempted. The Agriculture Department of the State Government has been trying to evolve the most suitable cropping pattern for these areas.

The Soil Conservation Training School at Koraput was established on the 1st June 1959. In each session, 40 trainees are admitted. The duration of training is six months and the trainees are imparted instruction in soil survey, soil conservation, soil conservation engineering, agronomy and forestry.

58. Soil types

No systematic soil survey has been made as yet. Soil samples collected from different parts of the district are sent to the laboratory at Sambalpur for test. The following soil classification is based on physical characteristics only.

(i) Coarse-textured sandy soil

This soil is found in Rayagada and Bissamcuttack areas on both sides of the Nagavali river and is composed of a large percentage of, coarsed texture-sand and a small amount of organic matter. On the low lands of this area paddy is grown. On the high lands pulses, ground-nuts and millets are grown in *khariff* and cash crops, such as sugarcane tobacco, chilli, oil-seed, are grown in *rabi*.

(ii) Fine silty alluvial soil

Available on both sides of the Indravati river in Nowrangpur and Borigumma areas, it is very rich in organic matter and contains silt and fine sand deposits of the river Indravati. Paddy is grown in low lands and sugarcane, tobacco, chilli, vegetable, wheat, lentil, field-pea are grown on well-drained *attal* lands.

(iii) Coarse-textured alluvial soil

This soil is found in Gunupur subdivision on both sides of the Vamsadhara and is composed of coarse sand, silt and clay. In low lands paddy and gingelly are grown in rotation. Similarly on high lands ragi and jowar in *khariff* season and oil-seed in *rabi* season are grown in rotation.

(iv) Red laterite soil

This soil is found in the whole of Koraput subdivision and partly in Jeypore tahsil of Nowrangpur subdivision. It is red in colour and very clayey in nature, poor in organic matter contents, its fertility is low. Generally early paddy, ragi, *Suan*, sweet potato, groundnut and a small amount of jowar or bajra are grown in *khariff* season and niger, the important oil-seed crop, is grown in the *rabi* season on high lands.

The low land which draws its fertility from the rain-streams of high lands can support two paddy crops, if perennial irrigation facilities are provided.

(v) Black soil

It occurs mainly in Malkangiri subdivision. Deep black in colour, it contains a large percentage of organic matter. It is formed by the decomposition of forest grasses which grow very luxuriantly in the areas.

(vi) Black cotton soil

This soil occurs in Umarkot tahsil of Nowrangpur subdivision and covers an area of about 1,000 square miles. It is slightly alkaline in nature. The soil stiffens and cracks when dry and grows sticky with a shower or two. Though black in colour, its humus content is poor. The sub-soil is light yellow, impervious and forms a hard pan below the cultivated soil. Generally paddy is grown in medium and low lands. Ragi, jowar, maize, arhar, castor, *Dhanicha* and sunn-hemp are grown on high lands during *khariff* season.

During *rabi* season the paddy lands remain fallow. High lands near about the villages are put under mustard, gram, linseed and vegetables.

59. Cropping pattern

No uniform cropping pattern is followed in the district. In the high hill-slopes where Podu cultivation is practised pulses and oil-seeds are found to be the usual crops. In the high land the suitable patterns are millet crops and oil-seed crops, either one followed by the other or there is a period of rest after the millet crop and before the oil-seed is taken up. Important millet crops are *Suan* and ragi and oil-seed crops are generally niger and mustard. In the low land paddy is generally cultivated and where there are facilities for water Dalua paddy is also grown. Pulses are generally raised in the higher ridges. Among the garden crops mention may be made of sweet potato, maize, vegetables and beans. Vegetable crops, which were unusual in the district sometime ago, are now being increasingly grown by enterprising *Malis*. The Pottangi and Semiliguda farms are noted for vegetable crops.

Double-cropping is the exception in the district for the reason that there is very little moisture left in the field after the main crop to enable the land to produce another. While paddy is the main crop certain crops are popular and quite extensively raised in certain areas as shown below:

Wheat	.. Kotpad region
Sugarcane	.. Rayagada region
Tobacco	.. Narayanpatna and Kalyansingpur regions.
Mustard	.. Kalyansingpur region

60. Crops

The area sown more than once in 1961-62 was 17,668 acres. In this district, total area under cultivation is 1,772,731 acres and 189,548 acres are classed under culturable waste. Crops are grown over an elevation ranging from 200 feet to 4,000 feet over sea-level. The principal crops grown in the district are paddy, wheat, millët, ragi, *Suan*, maize, sweet potato, jowar, bajra and pulses. Among the commercial crops, sugarcane, tobacco, potato, fruits and vegetables need mention. Besides, gingelly, mustard, castor, groundnut and niger are also cultivated.

Appendix A shows the average yield and acreage of different crops in the district for the years 1958-59 and 1959-60.

(i) Paddy *

This is mostly grown in *khariff* season. Dalua paddy is grown towards the end of the *rabi* season and harvested in the month of June. This is mainly grown in *jhola* or low lands. The word *jhola* is used to describe the method of using beds of streams for cultivation. The bed of the stream is levelled and terraced. Flood water is drained out by drains on both sides. As the land is naturally irrigated, two crops of paddy are grown.

Generally, broadcasting method is followed. Transplanting occupies a small proportion of the total paddy area. Underbroadcasting method dry and wet sowing are practised. Dry sowing is practised in the whole of Nowrangpur and Rayagada subdivisions. Wet sowing is resorted to in Koraput subdivision where a practice of *myda* cultivation is also popular. In this, one early variety is mixed with a late variety and seeds are broadcast in the wet lands after soaking them for 24 hours in water. The early paddy matures in the month of June and is harvested along with green-leaves of the late variety. The late variety then puts up new growth and comes to maturity in the month of December and is harvested early in January. Generally, cultivators put 3 to 4 cart-loads of cattle manure per acre in their paddy lands in Nowrangpur and Rayagada subdivisions. In Koraput no manures or fertilisers are ordinarily used in paddy crop.

* Recent research has discovered many varieties of wild paddy in Koraput district. Some of them lead to spontaneous hybridisation. In the remote past when Saoras, Bondas and Gadabas settled in this region they gradually improved the wild paddy. The system of *myda* cultivation of the Gadabas and the terraced cultivation of the Saoras are very ancient and took centuries to develop. Making of a terrace on a hill-slope is such a slow process that some of the terraces on Saora hills with ten feet high boulder walls must have taken several centuries to come to the present stage. All facts considered, some scholars have propounded the theory that the Saora hills are the original home of the paddy plant in India, if not in Asia.

(ii) Ragi

In ragi lands 2 to 3 cart-loads of farmyard manure is used while preparing the land. Broadcasting is the rule though transplanting is taken recourse to occasionally.

(iii) Suan

Generally broadcasting is practised and no manure is given.

(iv) Mung

Broadcasting is followed.

(v) Castor

Castor is sown broadcast as a pure crop and along the periphery of sugarcane fields.

(vi) Groundnut

Line sowing is done, no manure is applied.

(vii) Dalua paddy

Both broadcasting and transplanting are followed and no manure is given.

(viii) Wheat, gram and niger

Broadcasting is done and no manure is given.

(ix) Sesamum

This is cultivated on newly reclaimed lands. Broadcasting is followed and no manure is given.

(x) Mustard

It is grown near homestead land and is heavily manured. Broadcasting is generally followed.

(xi) Sugarcane

This crop is grown both in irrigated and non-irrigated conditions. Sowing the sets behind the furrow is the general practice. The growth is fine on fertile *attal* lands in the Indravati basin, even without manures. But in Rayagada area the crop demands one or two applications of fertilisers.

(xii) Tobacco

Seedlings are sown in lines. No fertiliser or manure is applied.

(xiii) Fruit and vegetables

Fruit and orchard trees are planted in the beginning of the *kharrif* season. Seedlings, grafts and *gooties* are used as planting materials. Vegetables are grown throughout the year. There is very good prospect of growing winter vegetables in all seasons in Koraput subdivision in the plateau lands of 3,000 feet.

Fruit crops receive a basal dose of manures and fertilisers before planting. Annual manuring of the fruit orchard is generally not done.

Manures and fertilisers are given in moderate doses to the vegetable crops.

61. Cultivation

(i) Podu cultivation

From February onwards the hillmen begin to fell patches of jungle on the hill-sides and set the felled timber alight as soon as it is dry. The land is thus cleared for cultivation and the ashes remain to fertilize the soil. As soon as the summer showers set in, the land is made ready for cultivation by simply stirring the soil with hand-hoes. Seeds of dry crops, such as jowar, *Mandia* (ragi) and *Olisa*, are scattered at the top of the cleared space and are washed down the hill-slopes by the monsoon rains. Due to the fertilising effect of wood-ash the yield of crops sown on felled hill-slopes is frequently very good. The practice of Podu cultivation varies in detail in accordance with the nature and extent of the forest land available, but it is an invariable rule that land thus cleared is abandoned after two or at most three successive years of cultivation, by which time the soil has been exhausted. Where possible, a hillman always prefers to clear a hill-slope for this sort of cultivation rather than a portion of plain land.

(ii) Jhola cultivation

This type of cultivation involves growing of paddy in the valleys of the hilly tracts of Koraput, Ganjam and Baudh-Khondmals districts.

The Adivasis reclaim the gullies and ravines, often appearing as cradle between two hills and convert them into terraced paddy fields. They often take advantage of the perennial spring to irrigate these narrow terraces during late winter and summer months.

The terraces are puddled during the months of February and March after which paddy is broadcast or sown in nursery beds. Usually sprouted seeds are broadcast and two varieties, early as well as late types, of paddy are mixed together and sown at the same time. The early variety matures during May while the late variety is harvested in November. This is done in order to have one additional crop of paddy before rains and to let the late variety establish itself and stand well the brunt of the torrential streams.

The other practice consists in transplanting paddy seedlings during early April after two to three showers as most of the springs become alive. This enables the plants to strike root before the onset of monsoon. The yield of late paddy varies from 15 to 20 maunds per acre while the early variety gives 5 to 6 maunds only.

On both sides drains are made to carry away the surplus water of the valley.

(iii) Monsoon potato cultivation

In higher altitudes, above 2,000 feet, potato cultivation during the *khariff* season is becoming popular. There seems to be scope to extend the coverage of this crop. It can be grown on high lands which are utilised now for growing ragi and *Suan*.

The area under paddy is said to be increasing because of the export trade, while the acreage under jute and cotton is almost static.

62. Agricultural implements

The older types of agricultural implements are commonly used in cultivation. They are *deshi* wooden plough, wooden plod-breaker (*copor potta*), two types of wet land leveller (*dharmuni* and *kurhu potta*), *phouda*, sickle and hand-axe. The Community Development Organisation is trying to popularise the modern implements. Introduction of large-scale mechanisation in agriculture would take time.

63. Seeds

The following improved paddy seeds are gradually gaining popularity:

- (i) Early varieties (No. 136, J 1, J 2)
- (ii) Medium varieties (T 442, J 10, T 141, T 1145)
- (iii) Late varieties (T 1242, T 90, BAM 6 late varieties)

The scheme to spread the use of improved seeds through multiplication is being replaced by another paddy seed production programme. To attain maximum purity, breeder seed would be produced in the research farm at Jeypore and foundation seed would be multiplied in Dabugan farm. It will then be distributed to individual farmers in packets and to registered seed-growers in bulk.

The Adivasi farmers do not pay much attention to the quality of seeds and seedlings. The cultivators from the South resettled in the district evince some interest. Quality seeds and seedlings are produced in Government farms for sale to the cultivators. Improved varieties of wheat, gram, mung and maize seeds are also supplied to them after procurement by the Agriculture staff.

Seeds available within the district are procured by the District Agriculture Officer for sale. But seeds not procurable within the district are indented through the Director of Agriculture. Potato seeds are procured from the cold storage at Cuttack. The demand for potato seeds in the district is growing steadily.

Appendix B gives the quantities of improved seeds supplied from 1950 to 1960.

Seeds are generally stored in *podugs* which are made out of paddy straw and in bamboo baskets or in earthen pots, the mouths of which are sealed with straw and cow-dung.

64. Manures and fertilisers

(i) As green-manuring is considered the cheapest method to enrich the soil, the Community Development Organisation has been trying to popularise the scheme of green-manure seed multiplication. More than 400 maunds of *Dhanicha* and about 100 maunds of sunn-hemp seeds were distributed to the cultivators during 1959-60.

Application of farmyard manure and leaving the land fallow are the two traditional methods for restoring soil fertility. About one-third of the high lands is left fallow for this purpose.

Compost and chemical manures are now being used by cultivators but on a very small scale. Cow-dung is mostly used as a manure but not as a fuel, excepting in a very few patches where forest does not exist.

In recent years, green-manuring paddy lands with *Dhanicha*, *dongar* lands with sunn-hemp and green-leaf manuring in double-cropped area are progressively receiving the attention of the cultivators.

(ii) Chemical fertilisers have yet to be popular with the Adivasi cultivators. The progressive cultivators are gradually adopting the application of chemical fertilisers, such as ammonium sulphate, super-phosphate and calcium ammonium nitrate. Appendix C gives the distribution of fertilisers among cultivators from 1958 to 1963.

AMMONIUM SULPHATE

The fertiliser is gaining popularity particularly with the sugarcane-growers of Rayagada area. The Regional Marketing Co-operative Societies at Rayagada, Jeypore and Gunupur have been marketing fertilisers in the district.

PHOSPHATIC FERTILISERS

With a view to increasing the use of phosphatic fertilisers, super-phosphate and bone-meal were being distributed initially at subsidised prices. Now the subsidy is discontinued and the supply is being made at cost price. A scheme for preparation of bone-meal through the Panchayats has been introduced.

65. Pest and plant protection

Paddy crop is attacked by pests called case-worm, hairy caterpillar, jassid, grasshopper, rice-bug, stem-borer, and diseases like paddy-blast and Udbatha.

Stem-borer is a common pest and leaf-rust is annually detected on wheat crop. Sugarcane is grown on a large scale on both the banks of the Indravati and around Rayagada. This crop is attacked by pests like stem-borers, root-borers, top-borers, white-ants and red-rot disease in a minor degree. Cases of albino are rare.

The potato crop is mainly attacked by tuber moth *epilachna beetle* and by diseases like potato blight both early and late. Virus diseases also occur. In vegetables like cabbage, cauliflower, the attack of cabbage diamond moth and aphids is generally found. Leaf-roller has been found attacking lady's-finger and cotton crop. Thrips and damping off of chillies, stem-borers and top-borers of brinjal, wilt disease of

tomato, insects like cutworm, aphids and leaf spot disease on tobacco are observed. *Orobancha* root parasite chooses mainly brinjal and tobacco as its host.

In places where oil-seed crops like groundnut and castor are grown, aphids and tricka diseases attack groundnut crop and castor semilooper castor crop. No pests and diseases are reported to attack niger crop which is grown on an extensive scale.

The pest and plant protection scheme has been brought into operation in this district since 1948. Arrangements have now been made to stock insecticides and fungicides with necessary equipments at Block and Grama Panchayat headquarters.

The cultivators generally take to the indigenous method of dusting wood-ash against aphids, thrips, etc., on vegetable crop.

In case of paddy pest and diseases, the cultivators take resort to enchanting of hymns by the *Desari* (the designation given to the priest) and planting of twigs in the paddy fields to drive the pest from the field.

66. Extension of improved methods of agriculture

The first step in this direction was laid with the establishment of one agricultural farm at Pottangi in 1938 primarily to experiment culturing of sub-tropical fruit-trees at an elevation of 3,200 ft. and a Rice Research Sub-station at Jeypore with an area of 14 acres to evolve suitable strains of paddy for cultivation in the district. The Grow More Food Scheme in the post-Second World War years needs mention.

Under the extension scheme, six thana demonstration farms were established during 1952-53. All these farms have been closed down excepting the one at Nowrangpur which is 9 acres in extent. A new farm for seed multiplication has been started on 15th January 1958 at Kotpad. A Sugarcane Research Sub-station was started at Rayagada in 1954. More systematic efforts were made after introduction of Community Development extension methods.

67. Agricultural Farms and Research Station

(i) Rice Research Sub-station, Jeypore

The Rice Research Sub-station at Jeypore undertook research in 1937 on rice through a scheme sponsored jointly by the Indian Council of Agricultural Research and the then Maharaja of Jeypore and continued up to 1946, when the State Government took it over.

Its objects are to collect samples of local varieties of paddy from Koraput and other adjoining districts except Ganjam and make selections from them with a view to isolate high-yielding strains, to test newly evolved types against the existing recommended strains of paddy and wheat, and to evolve new varieties of paddy by hybridisation followed by selection.

The following different varieties of paddy are released from this station:

Released name	Local name	Yield per acre	Suitable land
		Mds.Srs.	
Jeypore No. 1	.. Boli Bhuta	15-25	High land
Jeypore No. 2	.. Mohulkunchi	15-18	High land
Jeypore No. 3	.. Chitikona	13-16	High land
Jeypore No. 4	.. Soru-Munda-Balu.	24-26	Middling
Jeypore No. 5	.. Chudi	27-32	Middling
Jeypore No. 6	.. Ratnamali (Scented).	15-18	Middling
Jeypore No. 7	.. Kerandi	28-30	Low land
Jeypore No. 10	.. Baranga Chudi	22-25	High land
Hybrid No. 5		15-18	High land
Jeypore New Series 601-8.	Ghoda Khuta	30-32	Middling

Under the supervision of this station the pepper and cardamom research scheme was started at Pottangi farm in 1957 sponsored by the Indian Council of Agricultural Research and Government of Orissa in an area of 5 acres of land, having as its objectives to investigate the possibilities of growing black-pepper and cardamom in the State and to work out the optimum cultural and manurial requirements, besides ascertaining the most suitable variety of each.

(ii) Pottangi Farm

This farm is located in the hilly region of Koraput plateau at an elevation of 3,200 feet above sea-level. It was started in the year 1938 with an area of 12.07 acres of land. Now it extends over an area of 35.41 acres and is classified as follows:—

	Acres
Orchard	.. 8.33
Paddy and wheat, etc.	.. 22.01
Area under buildings	.. 2.00
Road	.. 1.93
Tank	.. 0.70
Cattle-shed	.. 0.10
Temporary shed, office, threshing-floor	.. 0.34
Total	.. 35.41

The soil is deep red loam tending to be sandy. The farm is irrigated from a perennial stream which has a temporary dam to divert it to the farm.

Tropical and sub-tropical fruit-trees, English and Indian vegetables and improved seeds, seedlings and grafts are produced on a commercial basis. Potato, paddy, maize and mung are also grown.

The present permanent staff of the farm consists of one Agricultural Overseer, one Fieldman Demonstrator, one peon, two permanent labourers.

(iii) Model Agricultural Agency Farm, Dabugan

This farm at Dabugan was established in 1948 with a view to providing work for the hill tribes throughout the year and training them to adopt improved methods of agriculture and to popularise the scientific methods of crop production.

The farm has a total area of 69.44 acres, of which about 9 acres are not available for cultivation being under office building, labour-shed, cattle-shed, threshing-floor, irrigation channel, roads and two tanks, and the remaining area is cultivated as follows:

	Acres
Mango orchard	.. 0.45
Sopeta, Citrus, Guava	.. 0.92
Pineapple	.. 0.19
Banana	.. 1.30
Paddy	.. 39.59
Wheat	.. 9.30
Red Til	.. 2.90
Sugarcane	.. 1.47
Gram	.. 3.00
Green-manuring	.. 0.03
Potato	.. 1.36

The farm is managed by one Agricultural Overseer, one Sub-Overseer, one Fieldman Demonstrator, four permanent labourers and one peon.

(iv) Borigumma Seed Farm

This is primarily a paddy seed-producing farm. The area of the farm is 13 acres out of which 12.40 acres have been occupied by paddy cultivation, 0.40 acre by vegetables and 0.20 acre by staff quarters. The staff of the farm consists of one Agricultural Sub-Overseer and one permanent labourer.

(v) Nisar Vegetable Farm

The farm is primarily meant for producing vegetables and seeds. It covers an area of 40 acres and is irrigated by Marbariguda Nala.

(vi) Mixed Farm at Semiliguda

The farm started in November 1963 and its main purpose is to supply fruits, vegetables, milk, eggs and poultry to the new township developing around the Aero-Engine Factory at Sunabeda. The township may have in course of some years a sizeable population, and the farm may find a good market for its produce. The intention is also to develop the farm in a phased programme so as to ensure increased production in the adjoining areas through extension services. For this, quality seeds, grafts, progeny cattle and progeny poultry will be made available to neighbouring villages.

The total layout area of the farm is 2,169.24 acres classified as below :

				Acres
1. Paddy land	..	1st class	..	195.80
		2nd class	..	58.50
		3rd class	..	55.34
2. Dongar land	..	1st class	..	634.91
		2nd class	..	406.23
		3rd class	..	251.68
3. Government land, hills and hillocks.	..			556.78

IRRIGATION

For facility of irrigation, it is proposed to construct a dam across Golgad Nala, a feeder of river Kolab, at an estimated cost of Rs. 15,00,000. This may provide irrigation to about 1,455 acres in *rabi* and 745 acres in *khariff*. The preliminary works have started and it may take about two years to complete the Project. For the time being, a lift irrigation scheme on the same Nala has been taken up at a cost of Rs. 1,71,000 by the Lift Irrigation Directorate.

COLD STORAGE

A cold storage at an estimated cost of Rs. 13,00,000 and with a capacity to store 4,000 maunds is under construction.

MANAGEMENT

The farm is divided into four units :

- (i) Administrative Section
- (ii) General Farm Section
- (iii) Fruit Section
- (iv) Vegetable Section

One Deputy Director of Agriculture remains in over all charge of the farm. The following shows the details of farm staff :

Administrative Section—Deputy Director of Agriculture—1, Agricultural Engineer—1, Head Clerk—1, Accountant—1, Senior Clerk—1, Store Clerk—1, Steno, Grade III—1, Junior Clerks—3, Agricultural Engineering Overseer—1, Work Sarkar—1, Peons—4, Watchman—1, Jeep Driver—1, Truck Driver—1, Helper—1.

General Farm Section—Agricultural Officers—5, Agricultural Supervisors—15, Tractor Drivers—15, Fieldman Demonstrators—30, Watchers—5, Accountants—5, Store-keepers—5, Peons—10, Khansama—1, Attendants—2.

Fruit Orchard Section—Agricultural Supervisors—3, Grafters—4, Peons—2, Gardeners—30, Tractor Drivers—3, Permanent Labourers—5, Watcher—1, Accountant—1, Store Clerk (Junior)—1.

Vegetable Garden Section—Vegetable Specialist—1, Agricultural Supervisors—2, Accountant—1, Trained Sub-Overseers (Agricultural)—4, Gardeners—26, Tractor Drivers—3, Permanent Labourers—10, Peons—2, Watcher—1, Store-keeper—1.

Poultry and Dairy units are yet to be organised.

CROPPING

During 1964-65, 159.48 acres were brought under different crops and 67 acres under vegetables, 120 acres under fruit orchard and 200 acres under green-manuring. During *rabi* season 251 acres were brought under different crops. The total receipts during 1964-65 were only Rs. 43,836. The receipts are expected to gradually go up when the fruit orchard laid out at a cost of Rs. 65,000 comes to bearing. The total capital expenditure on the farm, so far incurred, is Rs. 12,00,000. This excludes costs of irrigation and cold storage. It may be mentioned that cold storage is not a part of the farm programme as it is required to store the farmers' produce as well as part of the farm produce. In the long run, the farm is expected to make good profit every year.

(vii) Besides, there are three other farms at Kotpad, Narayanpur and Narayanpatna. Broad details about their acreage are indicated below :

	Total area (in acres)	Cultivated area (in acres)	Paddy area (in acres)
1. Kotpad ..	102.67	59.44	54.65
2. Narayanpur ..	36.58	32.29	32.48
3. Narayanpatna ..	40.00	36.75	29.75

68. State Assistance

For improvement of the condition of the agriculturists and also of the agricultural land the State Government is advancing taccavi loans year after year under the Agriculturists' Loans Act and Land Improvement Act. The amount of loans given under these Acts during the last five years is stated below :

Year		Under A. L. Act.	Under L. I. Act.
		Rs.	Rs.
1960-61	..	70,000	60,400
1961-62	..	1,48,690	1,31,000
1962-63	..	1,48,120	92,000
1963-64	..	42,325	38,570
1964-65	..	24,000	15,000

The amount of loans disbursed during 1963-64 and 1964-65 has fallen because of the loans advanced by the Co-operative Credit Societies which are increasingly getting popular in the district.

69. Animal Husbandry

The general condition of the livestock in the district is of the poorest quality. The local cattle are inferior both for draught and milch purposes to those of coastal districts of Orissa. The great majority of the carts which pass up and down the Salur-Jeypore Road is drawn by bullocks in the plains. Trade in livestock is moderately carried on. There is free movement of cattle into this district for sale from the neighbouring States of Madhya Pradesh and Andhra Pradesh.

(i) Measures to improve quality breeds

Seven stud bulls supplied by Utkal Gomangal Samiti were stationed at Koraput, Nowrangpur, Borigumma, Gudari, Ambadola, Gunupur and Narayanpatna for quality breeds. For improvement of the non-descript type cattle in this district breeding programme has been taken up by establishment of natural stud centres with Red Sindhi bulls. Several Blocks also have started upgrading the local cattle by giving bulls to the people on subsidy basis. In some Block headquarters stud bulls (Red Sindhi) are maintained for purpose of better breeding. In 1963-64, 12 Blocks had 19 bull centres and the number of progenies born was 503. There were 4 buffalo bulls in Kashipur Block and 153 progenies were born there.

Cattle of Motu breed are short and hardy and are reputed for draught as well as for milk.

In 1963-64 there were 33 Buck centres with Beetal bucks for upgrading the local stock of the district.

In order to upgrade the local pigs improved boars were also supplied to different Blocks, and they were maintained by the hosts on subsidy basis. In 1963-64 there were 9 boar centres, one at Nowrangpur, two at Nandapur, one at Kashipur and five at Narayanpatna Blocks. The number of progenies born in these centres was 295.

Cattle shows are organised from time to time in the district and the best exhibits are rewarded

(ii) Veterinary Dispensaries and Stockman Centres.

As early as 1929 a Veterinary Dispensary was opened at Jeypore. In 1937 the average number of animals treated there per day was 39. There was then one touring Veterinary Surgeon for each of the subdivisions.

In 1961-62, twenty-three Veterinary Dispensaries functioned in the district out of which sixteen were provided with Diagnostic sets. The activities of the Veterinary Department considerably increased in recent years due to execution of Block Animal Husbandry programmes. In 1963-64, 26 out of 36 Blocks were provided with either Veterinary Assistant Surgeons or Veterinary Technicians. Each of the 36 Blocks was provided with two or more Stockman centres except Pottangi, Kundra, Nandahandi and Mathili where there was only one Stockman centre in each. Castration of animals, inoculation and treatment of simple diseases are attended to at the Stockman centres. The main function of the Veterinary staff is to check contagious diseases prevailing among domesticated animals and to treat the animals of the locality in case of diseases. The staff also are to check rinderpest disease among the cattle.

70. Poultry

Under the Poultry Development Scheme of the State Government, a Regional Poultry Farm was started in 1955 at Koraput to feed birds for the schemes in Koraput, Kalahandi, Ganjam and Baudh-Khondmals districts. The egg-producing capacity of the birds was not impaired even during the summer due to the cool climate at Koraput. Under the Expanded Nutrition Programme the Umarkot, Borigumma, Nowrangpur, Boipariguda, Nandapur, Kashipur and Gudari Blocks have opened up several poultry units with 40 hens and 4 cocks as one unit. Mahila Samitis attached to the Blocks have also taken up poultry rearing for supply of eggs to expectant mothers. There is an Applied Nutrition Programme Block at Boipariguda with 100 layers and this is expected to expand up to 300 layers. At Jeypore, there is one departmental unit, the strength of which is two cocks and 20 hens. There are Block units at Kalyansingpur, Rayagada and Narayanpatna with 20, 20 and 70 hens respectively.

For upgrading the local birds improved cocks are supplied to poultry-keepers on bird per bird exchange basis.

71. Animal diseases

(i) The principal diseases prevalent in the district are rinderpest, blackquarter, anthrax, foot-and-mouth disease, ranikhet disease and haemorrhagic septicaemia. Outbreaks in epidemic form are rather rare although rinderpest is sometimes found in such form. Import of diseased animal from outside and random throwing of hides and dead animals are some of the reasons for spread of contagious diseases. Preventive inoculation in mass scale is undertaken to prevent epidemics.

(ii) Rinderpest Eradication Scheme

The scheme is in operation in the district since October 1958 with one Technical Assistant, 3 Veterinary Technicians and 20 Veterinary Stockmen. They are divided into 3 teams each headed by a Veterinary Technician and carry on intensive vaccination programme. A deep freeze unit is maintained at Koraput to store vaccines for timely supply to those teams. About 70 to 80 per cent of the cattle population receives vaccination under this scheme.

72. Fisheries

The district has a total water area of 29,210 acres suitable for pisciculture out of which only 16 per cent is available for purpose of pisciculture, the rest being either silted up or dried during the summer* Pisciculture is carried out in 31 out of 36 Blocks of the district in 338 tanks covering an area of about 643 acres. The following table shows the progress of pisciculture in Grama Panchayats during 1960-61 to 1963-64 :

Year		Area (in acres) under piscicul- ture	Number of fingerlings distributed	Receipts
				Rs. P.
1960-61	..	281.01	426,200	13,504.29
1961-62	..	281.01	191,610	14,777.80
1962-63	..	400.43	828,095	16,947.90
1963-64	...	643.00	1,032,930	51,562.71

The above figures indicate a steady increase in receipts from fisheries from year to year. Besides Blocks, a number of private individuals have taken up pisciculture and there has been a supply of 42,900 fries

* Sample Survey conducted by the Fisheries Department of Orissa

of major Indian Carps and 1,300 fries of Cy. Carps to such persons. A target of 20 acres of nursery has been fixed for this district and there has been a total rearing of 454,200 fries in 41 projects spreading over 11 Blocks. Induced breeding (by pituitary injection) was successful at Malkangiri fish farm from which improved varieties of major Indian Carps were supplied to the Grama Panchayats. The Rohi which was once unknown in the district is now available in plenty.

73. Forestry

The forests have great contribution to the economic life of the district. A detailed account of the forest belts and the Government policy for its protection find place in Chapter I. A statement of areas of demarcated forests in various forest ranges is given in Appendix D.

74. Forest-produce

(i) Major forest-produce

The following species, fit for timber, are available :

- (1) *Shorea robusta* or *Sal* (Adequately available)
- (2) *Pterocarpus marsupium* or *Piasal* (Moderately available)
- (3) *Tectona grandis* or *Saguan*

(4) Others like *Terminalia* (*Sahaj*), *Artocarpus* (*Panas*), etc., are also available in suitable quantities in Malkangiri, Motu, Bissam-cuttack and Gudari ranges.

(ii) Minor forest-produce

The district is rich in minor forest-produce. Mentioned below are some of the important items :

- (1) Tamarind, (2) Myrobalan, (3) *Adda* leaves, (4) *Sabai* grass, (5) *Beedi* leaves, and (6) *Rauwolfia serpentina*.

Others like *Sal*, resin, *Rella* bark, lac, soapnuts, reeds, canes, honey, arrow-root, *Mohua* flower and seeds, *Pongam* seeds, cleaning nuts, wax, horns, skins, nux-vomica, shoekey, marking nuts, gooseberry, *Thangudu* bark, *Kusum* seed, brooms, silk cotton, *Kath* and medicinal herbs are available.

75. Markets for forest-produce

It is only such produce, which is in surplus after meeting consumption by the inhabitants according to the rights and customs, that is given over to the Forest Marketing Co-operative Society for disposal.

Sal forms the most important timber. Sleepers in large numbers are supplied to the Railways.

Teak, bamboo and other miscellaneous species in Motu and Malkangiri ranges are transported to Rajahmundry along the rivers Sabari and Godavari. Bamboos of the Gudari range are floated along the river Vamsadhara to Andhra Pradesh.

Bija (*Pterocarpus marsupium*) in the shape of toughly squared spokes, felloes, etc., are transported to Andhra Pradesh from Bissamcuttack, Rayagada, Gunupur and Gudari ranges. The rest is used by the local population for building and other purposes.

From among the minor forest-produce, tamarind is exported to Bezwada of Andhra Pradesh, myrobalan to Bombay and thence to America, *Adda* leaves are exported to Andhra Pradesh, *Sabai* grass to Titaghur Paper Mills and Beedi leaves to the southern parts of Madras State.

As regards other produces, *Mohua* flower is used for distillation in Koraput district, *Kath* is transported to Bolangir, lac to Calcutta, barks to Madras, brooms to Bombay and the rest are partly consumed locally and partly exported to Salur of Andhra Pradesh.

76. Rights and concessions

No rights have been allowed within the reserved lands. Several rights and concessions are allowed in protected lands and unreserved lands. The rights and concessions in protected lands are the same as in unreserved lands excepting that new cultivation is not permitted in these forests and land under cultivation, if not cultivated for two seasons, shall not be reclaimed. Nineteen species of trees have been declared to be reserved in protected and unreserved lands. The felling of prohibited trees without permission of the Collector is an offence. In protected lands, the Collector can prohibit for a specified period grazing, felling and removal of other forest-produce. The clearing of any reserved land for Podu cultivation without express permission of the Collector is prohibited. Within unreserved and protected lands inhabitants of the villages or the adjoining villages are allowed, free of charge for domestic and agricultural use, cutting of grass, collection of minor produce, collection of leaves and shrubs of non-reserved species, felling of trees not reserved or prohibited and also grazing of their cattle. Privilege-holders, defined as members of 43 different hill tribes, are further permitted to fell reserved trees up to 3 feet in girth in unreserved or protected lands.

The old system of collection of annual royalty of Re. 0-4-0 to Re. 1 per plough of a family and commutation royalty at Re. 0-1-0 per rupee of land-cess and allowing to remove timber and other requirements for domestic and agricultural use continues in some parts of Rayagada, Bissamcuttack, Umarkot and Kotpad ranges but this is limited to only non-privilege-holders.

Under the Reserved Lands Shooting Rules, hunting and shooting without licence is prohibited. However, the hill tribes are given certain customary concessions in this regard during 'Chaitra' festival. Free licences are given by the Collector to hunters to shoot man-eating tigers and panthers. Hill tribes are given free concession to fish in rivers and ponds within reserved lands.

77. Exploitation of forest-produce

(i) Timber

There were three timber leases, out of which the most important was the one given to Messrs. H. Dear & Co., mostly to supply sleepers to the Railways. It covered *Sal* forests in Kotpad, Nowrangpur, Ramagiri, Malkangiri and Umarmkot ranges. The timber lease was granted at the first instance for 5 years from 1st October 1917 for felling of trees above 6 feet in girth from the reserved and $4\frac{1}{2}$ feet in girth from unreserved forests. This was terminated in 1922 and a fresh lease for 25 years was granted for Umarmkot and Ramagiri ranges from 1st April 1923. This was again cancelled in 1944 and a fresh lease granted for 6 years, i.e., from 1st July 1944 to 30th June 1950. Minimum royalty was fixed at Rs. 40,000 per annum and a fresh lease was granted from 1st July 1950 to 30th June 1951. This was renewed twice up to 28th December 1960 after which no further extension was allowed. At present leases are given to Orissa Forest Corporation only.

(ii) B. T. T. Co. lease

Sal trees were granted at the royalty rates to Messrs. B. T. T. Co. for supply of sleepers to the Railway for a period of 3 years from 1st July 1948 to 30th June 1951. This covered the forests of Bissamcuttack and Gudari ranges. The exploitable girth was $5\frac{1}{2}$ feet or over in reserved and protected lands and $4\frac{1}{2}$ feet or over in unreserved lands. The lease was extended up to 30th June 1953. In subsequent years the lease was put to auction till it was given to Orissa Forest Corporation in 1962-63.

(iii) Lease to Messrs. Motu Industries

The lease was granted at the low rates of Re. 0-5-0 to Re. 0-6-0 per c.ft. for 10 years from 1937 in Malkangiri, Motu and Ramagiri ranges for teak, *Bija*, *Hallandu*, *Sisoo*, over 4 feet in girth. This lease was cancelled and a fresh lease granted to them for 15 years from 1st March 1944 to 28th February 1959, at the rates revised from 1st July 1951. This was terminated in 1954.

(iv) Fuel Coupes

For meeting the local demand of fuel and small timber, coupes are formed at different places under rough working schemes. Coppice working circles of 60 years' or 40 years' rotation are maintained in the

Forest ranges and the felling series are demarcated in each working circle. This system is working in the Jeypore Forest Division of the district where there are 300 coupes at present.

(v) **Bamboo**

Bamboo is leased out annually. Motu Industries used to float them in rafts to Godavari district. In Rayagada Division, the bamboo contractor of Gudari range floated them on the river Vamsadhara for export. Bamboo forests are now worked on a rotation of 4 years on a scheme approved by the Chief Conservator of Forests.

78. Exploitation of minor forest-produce

Lac is worked by contract. The ryot reared lac in the *Kusum* trees available in Umarkot range by receiving brood lac from the Forest Department and giving half to the Government free of cost and the balance at the prevailing market rate, if needed.

The other main items of minor forest-produce given on lease were *Beedi* leaves, *Adda* leaves, galnut, *Sal* resin and tamarind which were leased out on monopoly basis except tamarind which was on seigniorage basis.

Other minor forest-produce, such as *Rella* bark, soapnuts, honey, arrow-root, *Mohua* flower and seed, *Pongam* seed, *Mohua* oil, cleaning nut, wax, horns and skins of wild animals, marking nuts, wild brooms, silk cotton, limestone, etc., were being leased out annually by auction. At present most of the items are leased out to the Forest Marketing Co-operative Society and the Government fixes the amount of lease-money.

Rauwolfia serpentina is being exploited in the district from 1960. The amount of money fetched by this from 1960-61 to 1963-64 is shown below :

Year	Amount
	Rs.
1960-61	.. 10,300
1961-62	.. 1,200
1962-63	.. 4,166
1963-64	.. 1,787

79. Present system of management

There is no working plan. The old methods of management continued after vesting of the estate in 1952 and even after transfer of forest management to Forest Department in 1957. Leases were being given to private companies like Messrs. H. Dear & Co., B. T. T. Co., Motu Industries as noted above. But all such leases stopped in 1960 after

which the practice of annual auction was followed, and with the formation of Orissa Forest Corporation in 1962 all leases were given to that body. The annual coupes continue as before under rough working schemes. Myrobalan and bamboos are also being leased out for terms extending to 3 or 4 years. The Kendu leaves are now worked according to the State Trading Scheme under which agents and purchasers are appointed for collecting and removing the leaves respectively.

After the transfer of management a few more timber and firewood coupes have been opened. The wasteful method of disposing of *Sal* or forest-produce by issue of permits has been discontinued.

80. Forest-revenue

The forest-revenue from various sources are given in Appendix E.

81. Development of forests

For preservation and development of forests in the district, a lot of reorganisation and change in rules and prescription seem to be necessary.

A working plan has to be prepared and followed in place of the existing working schemes. Podu cultivation is now forbidden on reserved and protected lands and is allowed on unreserved lands subject to permission from the Collector of the district. More stringent prescriptions have to be devised to prevent the menacing effects of this type of cultivation. The present reserved lands consisting of 191 forest blocks and comprising 1,592 square miles may be constituted into reserved forests. The ex-Mokhasa and Inam forests also need to be demarcated and reserved. Certain rules in operation in other parts of the State relating to timber transit, shooting, etc., need to be extended to the forests in the district, while many of the rules in vogue require amendment to ensure better preservation. Teak plantation on large scale is possible in Motu, Malkangiri and Jharigan ranges, and along the banks of Sabari. The current schedule of rates of royalty in force since 1900 is too low and needs revision. There is also scope to open a few game sanctuaries particularly in the Malkangiri range where wild buffaloes are available in large number.

There is scope to start a few forest-based industries like a paper pulping plant with bamboos from Motu and Malkangiri ranges, a factory for tanning, lac industry and saw mills.

82. Natural calamities

Unlike the coastal districts of the State, this district is less subject to natural calamities. Situated within the region of cyclonic disturbances of the Bay of Bengal, this district is frequently visited by storms in the monsoon. The storm is generally accompanied by heavy rains

as the district is situated in the Eastern Ghat mountain ranges. After rainfall, almost all the rivers swell and give rise to flood. The annual precipitation is more due to presence of high mountains and deep forests. With heavy rains the mountain streams swell and become unfordable for sometime. But due to high gradient of surface, the water is drained out in an hour or two after the cessation of rains. The areas drained are generally mountain-valleys and are very thinly populated; the river-valley being steep, cultivation thereon is rare. A flood in the rivers, therefore, causes no great loss except in big mountain-rivers like Kolab and Machkund. In October 1931, these two rivers rose to unprecedented height due to abnormal rainfall of 21" in a single day at Pottangi. Measurements at the Bagara waterfalls showed that the discharge of the Kolab river water near the site for a hydro-electric dam reached the figure of 3 lakh cusecs. The Machkund rose to 40 feet. above its summer level at Kondakamberu and swept away the travellers' bungalow which had been built on a height presumed to be safe from floods. Villagers living on the banks of these rivers can tell of similar excesses in the past, of which the worst was in 1914.

The other two big rivers, Indravati and Vamsadhara, cause damage to crops in the years of heavy rain as they flow on comparatively plain lands. Indravati spreads to a large water reservoir on the plains of Kotpad area and Vamsadhara overflows its banks. Loss of crops have been reported to have occurred in these years of heavy rain. The gradient of the rivers in these areas being more than that of plain areas, water drains out swiftly leaving silt deposit on the lands and crops are raised again on the beds. During the floods of 1956, the kitchen of the rest-shed erected by the side of the river Kolab at Gupteswar was completely washed away and the rest-shed could withstand the ravages of flood with much difficulty. The flood swept away the crops of the valley of Vamsadhara twice and those on the valley of Indravati once.

There was heavy rainfall throughout the district continuing from the evening of 1st July 1956. The rainfall during the first five days was 19.51 inches at Jeypore, 11 inches at Malkangiri, 17.29 inches at Nowrangpur and 17.25 inches at Koraput. It was 10 inches on an average in the district during 48 hours ending on 2nd July 1956. The rainfall was the heaviest on 2nd July 1956 and the rivers Vamsadhara, Nagavali, Indravati and Kolab swelled up to abnormal levels on that day. The rate of rise in the Indravati and Vamsadhara was alarming. These rivers overtopped their banks in the evening of 2nd July 1956 and deluged the lower portion of the countryside on both the banks by the morning of 3rd July 1956, water entering into Gunupur and Gudari towns. About 100 square miles in the Indravati basin and nearly 40 square miles in the Vamsadhara basin remained under water for more than 48 hours. In the low-lying paddy fields water remained much longer.

As a result of this flood, an area of about 36,020 acres of cultivated land with a population of 42,000 was affected, 3,617 acres of land was sand-cast, 667 houses were damaged and 6 men lost their lives. There were 5 breaches in embankments. The Rayagada and Gunupur subdivisions were the sufferers.

In July 1962, another heavy rainfall occurred in the district to the west of the Ghats causing floods in all the local rivers. Rainfall was most intense to the immediate west of the Ghats which obstructed the heavy cloud wave. Between 9th and 10th of the month, Jeypore received more than 22 inches of rainfall. On the day following, Nowrangpur and Malkangiri received heavy falls as the cloud wave retracted towards the west and the south. Because of the heavy falls and the resultant floods in rivers some loss to agriculture was reported. Above a thousand acres of cultivated land were overcast with sand.

Though floods are not so damaging, drought resulting from failure of rains has been a source of calamity during the last few years. There has been total or partial failure of crops in some parts or other. In 1954 on the whole the district had less amount of rainfall and there was a general decline in crop conditions. Excepting certain areas, the general loss was assessed at 25 per cent. This affected 55,000 acres of land and 188,224 people*.

In 1957, rains completely ceased after September and the paddy and ragi crops were hard-hit. A number of water pumps were provided by the State Government to partially restore the crops.

There has been no visitation of a famine perhaps because the population is scanty and the foodgrains produced are always surplus. In 1919, there was famine in Visakhapatnam areas and scarcity was felt in this district due to heavy export of foodgrains. The hill tribes were tempted to sell away their produce at high price. This was checked by prohibition of export of foodgrains and the Maharaja of Jeypore helped to tide over the critical period by releasing a part of his large accumulation of foodgrains for sale.

*Drought in Orissa during 1954 and 1955

APPENDIX A

Average yield per acre of different crops
(in maunds)

Crops	1958-59	1959-60
<i>Cereals</i>		
Winter rice ..	5.07	8.89
Autumn rice ..	8.42	6.37
Summer rice ..	8.44	5.08
Jowar ..	6.00	6.00
Bajra ..	2.43	3.65
Maize ..	5.02	5.47
Ragi ..	3.88	3.88
Wheat ..	7.04	10.49
Millets ..	3.06	4.86
<i>Pulses</i>		
Gram ..	3.06	4.86
Arhar or Tur ..	7.20	7.20
Other Rabi crops ..	8.92	8.92
Other Khariff crops ..	6.50	5.00
<i>Other Crops</i>		
Sugarcane ..	52.90	20.54
Potato ..	36.05	36.48
Chilli ..	3.38	3.64
Ginger ..	10.03	10.10
Groundnut ..	10.26	13.61
Sesamum ..	2.04	2.04
Rape and Mustard ..	3.50	4.69
Linseed ..	2.99	2.99
Castor ..	2.52	2.52
Tobacco ..	8.14	8.14

**Area under different crops
(in acres)**

Crops	1958-59	1959-60
<i>Cereals</i>		
Winter rice ..	620,000	649,000
Autumn rice ..	147,000	126,000
Summer rice ..	300	600
Jowar ..	7,400	7,400
Bajra ..	4,300	7,600
Maize ..	11,200	11,200
Ragi ..	33,000	33,000
Wheat ..	2,000	2,000
Small Millet ..	2,000	5,000
<i>Pulses</i>		
Gram ..	4,500	4,500
Arhar or Tur ..	2,000	900
Other Rabi crops ..	9,700	5,300
Other Khariff crops ..	13,500	3,900
<i>Other Crops</i>		
Sugarcane ..	10,000	11,900
Potato ..	200	200
Chilli ..	1,860	1,900
Ginger ..	38	38
Groundnut ..	2,300	2,000
Sesamum ..	15,200	15,200
Rape and Mustard ..	9,600	20,000
Linseed ..	90)	900
Oil-seed (Castor) ..	20,400	20,400
Cotton ..	1,700	1,700
Jute ..	1,300	1,300
Mesta ..	850	850
Tobacco ..	3,000	3,000

APPENDIX B

Distribution of improved types of seed

Name of seeds	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
1	2	3	4	5	6	7	8	9	10	11
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
1. 'N' Paddy	753	1,133	1,288	1,548	1,141	101	1,513	3,129	2,905	2,865
2. 'A' Class Paddy.	1,710	1,086	2,794	753	405	248	..	..	..	..
3. 'D' Paddy	99	18	..	..	..	..	..	139	124	..
4. Maize	2	..	..	..	6	5	..	8	3	0-24-0
5. Mung	502	198	136	127	15	50	100	8	..	177
6. Ragi	56	..	..	..	14	..	..	1	1	21
7. Groundnut	7	..	..	15	..	..	..	7	..	42
8. Improved Wheat.	20	21	75	40	184	623	397	449	229	363
9. Improved Gram.	20	129	183	123	61	203	32	67	53	100

APPENDIX C

Distribution of chemical fertilisers in the district of Koraput during the last 5 years

(Figures in tons)

Year	A. S.	A. S. N.	C. A. N.	Urea	M. O. P.	Super-phosphate
1958-59	..	310.40	..	4.55	2.5	..
1959-60	..	932.90	17.05	181.80	22.95	..
1960-61	..	982.26	46.95	444.90	..	129.6
1961-62	..	682.55	118.90	235.90	..	0.30
1962-63	..	879.55	63.15	94.00	..	48.20

[70 B. of R.—24]

APPENDIX D

Area of demarcated forests

Name of Range		Number of demarcated Blocks	Area of demarcated forests in square miles	Blocks proposed (demarcated)	
				Number of	Area in square miles approximate
1. Jeypore	..	11	19.47	3	1.95
2. Ramagiri	..	13	169.37	5	5.16
3. Malkangiri	..	25	411.99	5	83.00
4. Motu	..	14	168.23	1	102.70
5. Kotpad	..	13	45.31	1	0.85
6. Nowrangpur	..	33	98.76	4	17.91
7. Umarkot	..	8	239.81	..	..
8. Jharigan	..	15	205.44	..	..
9. Koraput	..	36	38.52	6	41.14
10. Alamanda	..	17	42.91	3	45.65
11. Nandapur	..	31	52.09	..	..
12. Rayagada	..	23	58.18	15	93.06
13. Gunupur	..	29	77.76	4	13.34
14. Gudari	..	6	32.16	2	22.56
15. Bissamcuttack		7	49.34	8	53.13
Total	..	282	1,705.34	57	480.45

APPENDIX E

FOREST-REVENUE OF KORAPUT DISTRICT EXCLUDING KASHIUR RANCE

	1962-63		1963-64	
	Jeypore Division	Rayagada Division	Jeypore Division	Rayagada Division
(a) Timber, etc., removed by Government agency—	Rs.	Rs.	Rs.	Rs.
(i) Timber ..	19,23,766·79	..	58,149·98	13,476·00
(ii) Firewood ..	298·75	..	675·00	88,439·25
(b) Timber removed by purchasers—				
(i) Timber ..	19,50,304·98	83,368·18	13,42,693·60	86,910·37
(ii) Firewood ..	1,77,009·93	14,781·23	2,49,432·64	23,673·01
(iii) Bamboos ..	82,865·58	60,523·68	65,196·21	32,277·56
(iv) Grazing & fodder produces.	5,344·29	2,13,580·73	6,413·85	10,887·59
(v) Other minor forest produces.	1,68,075·60	2,06,939·47	1,49,408·24	1,24,797·90
(vi) Other items ..	..	48·51	..	14·00
(vii) Commutation fees ..	..	225·00	..	1,600·12
(viii) Kendu leaves ..	51,500·00	69,000·00	..	..
(c) Drift and waif wood	205·00	..	30·00	25·00
(d)(i) Fines and forfeitures	110·00	..	600·00	125·00
(ii) Othersources ..	31,834·12	15,241·48	42,526·89	10,845·56
(iii) Rent and buildings ..	1,429·92	2,045·42	1,150·89	2,010·57
Refund by Forest Officers.	..	(—)1,100·00	..	(—)2,147·13
Total ..	43,92,744·96	4,64,653·70	19,16,268·40	3,92,934·80
Grand Total ..	48,57,398·66		23,09,203·20	